ST. LAWRENCE HIGH SCHOOL

A JESUIT CHRISTIAN MINORITY INSTITUTION

CLASS 8

SUBJECT : **Arithmetic**   **Work sheet 21 answer key**

Marks:15   **Revision- Percentage**

Date:30.4.2020

Answer all the following questions(1×15=15)

1. A's salary is 50% more than B's. How much percent is B's salary less than A's?

a. 33(1/4)%
b. 33(1/3)%
c. 33(1/2)%
d. 33%

ANSWER: 33(1/3)%

Explanation:

Let salary of B be Rs. 100

So salary of A = 150% of Rs. 100 = Rs. 150

Now, how much percent is B's salary less than A's?

$$\frac{A's\ salary - B's\ salary}{A's\ salary} \times 100 = \frac{50}{150} \times 100 = 33\frac{1}{3}\%$$

2. Ramesh's salary was reduced by 10% and then the reduced salary was increased by 10%. What was his ultimate loss?

a. 0%
b. 10%
c. 1%
d. 5%

ANSWER: 1%

Explanation:

Let, initial salary be Rs. 100

Now salary was reduced by 10% so **salary becomes (100-10=) 90% of 100**

∴ Salary = Rs. 90

Now salary was increased by 10% so **salary becomes (100+10=) 110% of 90**

∴ **Salary = Rs. 99**

$$\textbf{Loss \%} = \frac{Loss}{Initial\ Salary} \times 100 = \frac{1}{100} \times 100 = \textbf{1\%}$$

3. In a country 55% population is female. 80% of the male population is literate. How much of females are literate if total literacy is 58%?

a. 45%
b. 55%
c. 40%
d. 22%

ANSWER: 40%

Explanation:

In such cases it is very easy to solve by taking total population = 100

So, **Females** = 55% of 100 = **55** and **Males** = 100-55 = **45**

Now, **literate population** = 58% of 100 = **58 people**

Male literate population = 80% of 45 = **36**

Also, **Female literates + Male literates = Total literates**

$\therefore$ Female literates = 58-36 = 22 females are literates

Now how much percent is 22 of 55?

Female Literates in % $= \dfrac{22}{55} \times 100 =$ **40%**

4. Two numbers are less than a third number by 30% and 37% respectively. How much percent is the second number less than the first?

a. 7%
b. 10%
c. 4%
d. 3%

ANSWER: 10%

Explanation:

Let the 3rd number be 100.

So, **1st number** is 30% less than 100 = (100-30)% of 100 = **70**

Also, **2nd number** is 37% less than 100 = (100-37)% of 100 = **63**

Now, how to find how much percent is 2nd number less than 1st?

% less $= \dfrac{70-63}{70} \times 100 = \dfrac{7}{70} \times 100 =$ **10%**

5.If X% of Y is 100 and Y% of Z is 200, find a relation between X and Z.

a. Z = X/2
b. Z = 2X
c. X = Z/4
d. Z = 4X

ANSWER: Z = 2X

Explanation:

As per given conditions,

$$\frac{X}{100} \times Y = 100 \qquad \therefore Y = \frac{100 \times 100}{X}$$

$$\text{Also,} \frac{Y}{100} \times Z = 200$$

$$\therefore \frac{100 \times 100 \times Z}{X \times 100} = 200$$

$$\therefore Z = 2X$$

6. If 20% of an electricity bill is deducted, then Rs. 100 is still to be paid. How much was the original bill?

a. Rs. 110
b. Rs. 115
c. Rs. 120
d. Rs. 125

After 20% bill has been deducted, we still have to pay Rs. 100

So remaining (100 – 20=) **80% bill = Rs. 100**

$$\therefore \frac{80}{100} \times \text{Bill} = 100$$

$$\therefore \text{Bill} = \text{Rs. } 125$$

7. 5% of 5% of Rs. 100 is

a. Rs. 0.25
b. Rs. 0.50
c. Rs. 10
d. Rs. 25

ANSWER: Rs. 0.25

Explanation:

$$5\% \text{ of } 5\% \text{ of Rs. } 100 = \frac{5}{100}(\frac{5}{100} \times 100) = \text{Rs. } 0.25$$

8. The price of milk was first increased by 10% and then decreased by 20%. What is the net percentage change in final price of milk?

a. 12%
b. 15%
c. 10%
d. 7.5%

ANSWER: 12%

Explanation:

Let original price be 100

Increase of 10% means now price = 100 + (10% of 100) = Rs. 110

Now decrease of 20% means new price = Rs. 110 – (20% of 110)

= 110-22 = Rs. 88

Difference in old and new price = 100-88 = 12 (as new price is

lower than old price)

12 is what percent of 100? It is 12%.

=> The new price is 12% lesser than the original price.

9. The price of apple is first increased by 10% and then decreased by 10%. What is the change in the price of apple?

a. 1.11%
b. 3.5%
c. 5%

d. 1%

ANSWER: 1%

Explanation:

Let original price be 100

Increase of 10% means the price now = 100 + (10% of 100)

$$= Rs. 110$$

Now decrease of 10% means price now = Rs. 110 – (10% of 110)

$$= 110-11 = Rs. 99$$

So change in price = 100-99 = Re. 1

1 is how much percent of 100? It is 1%

So change in price is 1%.

10. In an election which contested was contested by 2 candidates, one candidate got 40% of total votes and yet lost by 1000 votes. What is the total number of votes casted in the election?

a. 10000
b. 6000
c. 8000
d. 5000

ANSWER: 5000

Explanation:

Total votes $= a$

This means that, Votes of candidate $1 +$ Votes of candidate $2 = a$

We know that, Votes of candidate $1 = 40\%$ of $a = \dfrac{40a}{100}$

Hence, Votes of candidate $2 = (100\%\text{-}40\%)$ of $a = 60\%$ of $a = \dfrac{60a}{100}$

1st candidate lost by 1000 votes $=$ difference of votes between both candidates

$\therefore \dfrac{60a}{100} - \dfrac{40a}{100} = 1000$

$\therefore a = 5000$

11. If price of milk is 15% more than that of water, then price of water is how much per cent less than that of milk?

a. 5%
b. 7.50%
c. 13.05%
d. 10.50%

ANSWER: 13.05%

Explanation:

Suppose, 1litre water $=$ Rs. 100

So, 1litre milk will be Rs. $100 + (15\%$ of $100) = 100+15 =$ Rs. 115

Now, how would we express water as a percentage of milk?

$\dfrac{100}{115}$ x $100 = 86.95\%$

So, water is **86.95%** of milk $=>$ It is $(86.95\text{-}100)$

$= \mathbf{13.05\% \ less \ than \ that \ of \ milk.}$

12. By 20% decrease in the price of rice, people can buy 10 kg more rice in Rs.100. What is the original price of 1kg of rice?

a. Rs. 1.5
b. Rs. 2.5
c. Rs. 5

d. Rs. 4.5

ANSWER: Rs. 2.5

Explanation:

20% decrease in price means new price = 0.8P

Let us assume that people buy A kg rice in Rs. 100.

With 20% decrease in price, people will buy (A+10) kg rice in Rs. 100.

Expense = Rs. 100 = Price of rice x Quantity of rice

Since, **expense is same, we can say that**

A x P = (A+10) x 0.8P

∴ A = 0.8A + 8   (Cancelling 'P' on both sides)

∴ A = 40

Price of rice = $\dfrac{100}{40}$ = Rs. 2.5 per kg.

13. If price of rice is 30% less than that of wheat, then price of wheat is how much per cent more than that of rice?

a. 45%
b. 37.5%
c. 40.65%
d. 42.85%

ANSWER: 42.85%

Explanation:

Suppose, 1 Kg Wheat = Rs. 100

So, 1 Kg Rice will be Rs. 100 – (30% of 100) = 100-30 = Rs. 70

Now, how would we express wheat as a percentage of Rice?

$\dfrac{100}{70}$ X 100 = 142.85%

So, wheat is **142.85%** of Rice => It is (142.85-100)

= **42.85% more than that of Rice.**

14. In a class, 15% of total number of students failed in Science, 25% of total number of students failed in Maths and 10% of total number of students failed in both. How much percentage of students passed in both Maths and Science?
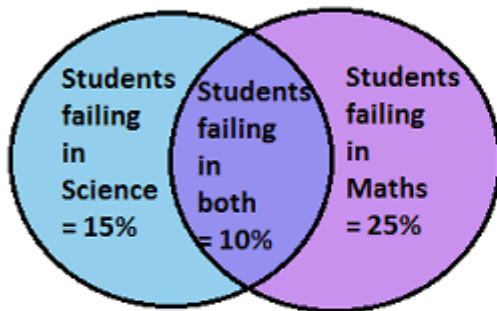
a. 70%
b. 80%
c. 60%
d. 90%

ANSWER: 70%

Explanation:
Usual Mistake: Percentage of Students failing in both subjects $= 25\% + 15\%$
$= 40\%$

But as shown in the below diagram, the students who failed both subjects (10%) are counted twice - Once in 15% (blue circle) and once again in 25% (orange circle).

We need to subtract this double counting.

So students who failed subjects would be $= 25\% + 15\% -10\% = 30\%$

> **Remember:**
>
> **Subtract only once and not twice!**

Percentage of students who passed in both subjects $= (100 - 30)\% = 70\%$

Thus, 70% passed in both subjects.

15. A scores 10% and fails by 30 marks. B scores 40% marks and gets 30 marks more than the minimum marks needed to pass the exam. What are the maximum marks for the exam?

a. 400
b. 200
c. 500
d. 350

ANSWER: 200

Explanation:

Maximum marks $= M$

<u>IMPORTANT</u> - In both cases minimum marks are the same

A gets 10% of M and fails by 30 marks

$$\therefore \frac{10M}{100} + 30 = \text{minimum marks}$$

B gets 40% of M and gets 30 marks more than minimum marks

$$\therefore \frac{40M}{100} - 30 = \text{minimum marks}$$

$$\therefore \frac{10M}{100} + 30 = \frac{40M}{100} - 30$$

$$\therefore 30 + 30 = \frac{40M}{100} - \frac{10M}{100}$$

$$\therefore \frac{30M}{100} = 60$$

$$\therefore M = 200$$

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